IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS

In re Application of:

Inventor:	:	Looper, Tony	) Examiner: Vrettakos, Peter J.
Serial No.	:	10/027,343	) Art Unit: 3739
Filing Date	:	Dec. 19, 2001	)
Title:	:	Reconfigurable Surgical Apparatus	)
Attorney Docket	:	VM6117/ALL8057	)

CERTIFICATE OF MAILING UNDER 37 C.F.R. §1.10(a)

Date of Deposit: March 1, 2005

I hereby certify that this Brief on Appeal is being deposited with the U.S. Postal Service, as U.S. Express Mail No. EV404972872US, postage prepaid, to: Commissioner for Patents, Board of Patent Appeals and Interferences, P.O. Box 1450, Alexandria, Virginia 22313-1450.

Christine Cameron

BRIEF ON APPEAL

Hon. Comm'r of Patents and Trademarks
Board of Patent Appeals and Interferences,
P. O. Box 1450
Alexandria, VA 22313-1450

Dear Commissioner:

This is the appeal brief (in triplicate) for the appeal filed January 7, 2005 in the above captioned case, appealing the Office Action of November 2, 2004 in which the Examiner finally rejected all pending Claims 43-84. The requisite fee set forth in 37 C.F.R. 1.17(f) of $500.00 is submitted herewith. If additional fees are required, please charge them to our Deposit Account No. 500256.

Respectfully submitted,

March 1, 2005

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BRIEF ON APPEAL

1. REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee, Allegiance Health Care, Inc.; 1430 Waukegan Road, McGaw Park, Il 60085.

2. RELATED APPEALS OR INTERFERENCES

None

3. NATURE AND STATUS OF THE CLAIMS

A. Nature of the Claims

Claims 43-84 are pending in the application.

Claims 43, 50, 51, 52, 56, 57, 61, 66, 71, and 78, are independent claims.

Claims 44-49 depend, directly or indirectly, from Claim 43; Claims 53-55 depend, directly or indirectly, from Claim 52; Claims 58-60 depend, directly or indirectly, from Claim 57; Claims 62-65 depend, directly or indirectly, from Claim 61; Claims 67-70 depend, directly or indirectly, from Claim 66; Claims 72-77 depend, directly or indirectly, from Claim 71; Claims 79-84 depend, directly or indirectly, from Claim 78.

B. Status of the Claims

Claims 1-42 were rejected in a first, non-final Office Action mailed March 24, 2003. Argument was made and technical amendments were made to Claims 24 and 28 in

an Amendment and Response made on June 12, 2003. The Examiner, in the next Office Action, made a final rejection of all claims (1-42), mailed on August 4, 2003. In an Amendment and Response mailed September 16, 2003, Applicant amended Claims 1-6, 8-34, and 36-41. An Advisory Action refusing entry of the proposed Amendments was mailed on October 16, 2003. A Request for Continued Examination was made on November 6, 2003. In a Response to Non-Compliant Amendment made January 30, 2004; all claims 1-42 were renumbered 43-84 to show that each of the claims were new claims. A non-final Office Action Was mailed on March 17, 2004. A telephonic interview was held on April 15, 2004 by Examiner Peter Vrettakos; and Attorneys Donald O. Nickey and Michael J. Gallagher for Applicant, and a further Amendment was made on April 22, 2004 to conform the application to the discussion with the Examiner. A final rejection was mailed on November 2, 2004, with the following effect:

Claims 43-84 were finally rejected under 35 U.S.C. §102(b);

Claims 43, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81, were finally rejected under 35 U.S.C. 103(a) as being unpatentable over Freitas (U.S. Pat. No. 5,486,185); AND

Claims 46-48, 63-65, 69-70, 75-76, and 82-84, were finally rejected under 35 U.S.C. §103(a) as being unpatentable over Freitas ('185) in view of Chien (GB 2227412A).

4. STATUS OF AMENDMENTS

No amendments were filed subsequent to the November 2, 2004, Office Action.

5. SUMMARY OF THE INVENTION

A. Overview

The present invention is directed to a reconfigurable surgical apparatus particularly suitable for endoscopic surgery. An overview of the apparatus is seen in FIG. 1. A surgical instrument assembly 110 includes a prime mover 130 that can be positioned within a hollow manipulation shaft 120. The prime mover 130 is activated by an actuator 135 located at a proximal end of the shaft 120. The prime mover 130 or such other elements, can be configured for both linear and rotational motion in certain arrangements of the surgical instrument 110.

As illustrated in FIG. 2, the surgical instrument assembly 110 also incorporates a coupler 140 that is formed about a distal end of the shaft 120. The coupler 140 joins the prime mover 130 to any of a wide array of tools 160, such as, dissectors, biopsy collectors, scissors, etc. For purposes of illustration, the instrument 110 of the instant invention is depicted as including an interchangeable surgical tool 160 in the general form of a scissors. In this configuration, the coupler 140 incorporates an anchor 170 that is adapted to releasably mate with the capture ledge 155.

In the exemplary arrangement of the instant invention shown in FIG. 2, the coupler 140 portion of the interchangeable surgical tool 160 includes at least one lateral recess 180 that includes at least one surface defined as the capture ledge 155. The interaction of the anchor 170 and the lateral recess 180 contributes unique design function to the invention as it allows any rotational force applied to the prime mover 130 to be directly transmitted to the tool 160. Any of a large number possible anchor 170 configurations may be suitable for purposes of the present invention, and can include the

anchor 170 formed as a generally hook shaped tine 190, as seen in FIG. 2. The invention may be configured such that the anchor 170, once inserted, cannot be removed from the prime mover 130 without breaking, which prevents re- use of a tool 160.

As seen in FIG. 3, the apparatus 100 may include a frangible portion 200, which in the various figures is reflected to be in the anchor 170. The frangible portion 200 can provide a "fail-safe" feature providing a fixed position for breakage at a pre-determined breaking stress; thereby preventing damage to the tool should it forcefully strike a hard object or be otherwise over-stressed. The frangible portion 200 reflected in the various figures, including FIGS. 2 and 3 is shown as being formed as a circumferential region of reduced diameter.

Numerous variations of the essential elements of the coupler 140 and tool 160 are possible, as are seen in FIGS. 4-6.

B. Concise Explanation of the Invention as Defined in Independent Claim 43 and Dependent Claims 44-49

1. Independent Claim 43

Applicant's invention as shown in the drawings, and as claimed in the first independent claim, is directed to a reconfigurable surgical apparatus 100. As seen in FIGS. 1 and 2, the apparatus comprises a hollow manipulation shaft 120 that internally receives a prime mover 130. The prime mover 130 slides, longitudinally, within the hollow manipulation shaft 120, to impart reciprocal motion derived from an actuator 135 to the prime mover 130. The distal end of the prime mover 130 has a coupler 140, which

allows the prime mover 130 to be coupled to an interchangeable surgical tool 160, and as defined in the specification, to cooperate and mate, the prime mover 130 and tool 160.

2. Dependent Claim 44

Claim 44, which depends from Claim 43, further defines the coupling mechanism. The coupling mechanism is a capture ledge 155, seen in FIG. 2, which is defined in the specification as having a surface or a portion of a surface with at least one lateral aperture or recess, that cooperates with an anchor 170 on the tool 160. The nature of the cooperation between the capture ledge 155 and the anchor 170 is critical to the functionality of the device, as will be discussed in detail below, as the lateral aperture or recess results in both any reciprocal motion, and any rotational motion, of the prime mover being necessarily transmitted to the tool 160.

3. Dependent Claim 45

Claim 45, which depends from Claim 44, further defines the anchor 170, claiming the same as a generally hook shaped tine 190 that engages in the recess to couple the anchor 170 and tool 160, as seen in FIG. 2.

4. Dependent Claim 46

Claim 46, which depends from Claim 43, further defines the anchor as a hook shaped tine 190 with a frangible portion 200. The frangible portion 200 is also critical to the functionality of the device, as will be discussed in detail below, as it allows both for a "fail-safe" stress point preventing damage to the tool 160 and can also assist in preventing re-use of the tool 160.

5. Dependent Claim 47

Claim 47, which depends from Claim 43, further defines the anchor 170 as having a frangible portion 200 that breaks substantially at a right angle to the translational movement of the prime mover 130.

6. Dependent Claim 48

Claim 48, which depends from Claim 46, further defines the apparatus 100 as being sealed from the environment and therefore necessarily from a patient, so that any broken frangible portion 200 is retained within the apparatus 100. This closed nature is also critical to the functionality of the device, as will be discussed in detail below, as it acts to minimize or eliminate the chance of small broken pieces of the frangible portion 200 of the apparatus 100, which is a medical device, from being inadvertently lost inside a patient's body.

7. Dependent Claim 49

Claim 49, which depends from Claim 44, further defines the frangible portion 200 as being removable from the recess 155 after failure of the frangible portion 200. This ability to design an apparatus in which the frangible portion 200 may, or may not, be removable after failure is also critical to the functionality of the device, as will be discussed in detail below. The option to have a removable frangible portion 200 provides the ability to restore and reuse the apparatus 100 after failure of the frangible portion 200. On the other hand, an embodiment with a non-removable frangible portion 200, as will be

seen below in Claim 50, makes the tool 160 non-reusable, as the only means for disassembling the tool 160 from the anchor is to break the frangible portion 200, and once broken, the ability to couple the anchor 170 and tool 160 is lost.

C. Concise Explanation of the Invention as Defined in Independent Claim 50

Independent Claim 50 claims the apparatus similarly to Claim 43 insofar as the functionality of the hollow manipulation shaft 120 and the prime mover 130, but adds the capability of transferring translational motion internal to the shaft 120, by means of a coupling mechanism comprising a capture ledge 155 and anchor 170. Claim 50, however, provides for the capture ledge 155 to be defined by a recess 190 in the coupler 140. Claim 50 also provides a non-releasable frangible portion 200. As discussed above, this allows for a non-reusable embodiment of the tool 160.

D. Concise Explanation of the Invention as Defined in Independent Claim 51

Independent Claim 51 claims the apparatus similarly to Claim 50, and further defines the anchor 170 as having a shear notch 210. As disclosed in the specification, the shear notch 210 causes the frangible portion 200 to break at a predetermined stress level and in both a predetermined manner and position on the frangible notch 200.

E. Concise Explanation of the Invention as Defined in Independent Claim 52 and Dependent Claims 53-55

1. Independent Claim 52

Independent Claim 52 claims the apparatus similarly to Claim 43 in terms of functionality, but reverses the relative positions of the anchor 170 and capture ledge 155, so that in this embodiment, the anchor 170 is found on the prime mover 130 and the capture ledge 155 is found on the tool 160.

2. Dependent Claim 53

In Claim 53, the capture ledge 155 of the tool 160 is formed with a lateral recess 180, analogous to the lateral recess 180 in the capture ledge of the anchor 170 claimed previously. Additionally, the lateral recess is adapted to non-releasably receive the anchor.

3. Dependent Claim 54

Claim 54, which depends from Claim 53, further defines the anchor 170 on the prime mover 130 as being a hook shaped tine 190 sized for non-releasable receipt into the capture ledge 155 of the tool 160. This creates a non-reusable embodiment of the prime mover 130, as contrasted to a non-reusable tool 160, as discussed above.

4. Dependent Claim 55

Claim 55, which depends from Claim 52, further defines the anchor 170 on the prime mover 130 as having an engagement face 195 adapted for non-releasable

engagement. As disclosed in the specification, such "adaptation" involves a variety of possible non-releasable engaging devices, such as teeth, that cooperate between the anchor 170 and the capture ledge 155 to prevent release.

F. Concise Explanation of the Invention as Defined in Independent Claim 56

Independent Claim 56 claims the apparatus 100 in general configuration analogous to that seen in Claims 52 and 53 with the hook shaped tine 190 claimed in Claims 54 and 55, but without the non-releasable feature claimed in Claims 54 and 55. Claim 56 also includes the element that the nature of the cooperation between the prime mover 130 and the tool 160, via the engagement face 195, is such as to be capable of transferring rotational force from the prime mover 130 to the tool 160.

G. Concise Explanation of the Invention as Defined in Independent Claim 57 and Dependent Claims 58-60

1. Independent Claim 57

Independent Claim 57 claims the apparatus 100 in a manner substantially analogous to Claim 56, but removes recitation of a particular configuration as to the cooperation between the coupler and tool, i.e., the "hook shaped tine" and "capture" ledge," and claims only a coupler 140 with an anchor 170 on the prime mover 130 that cooperates with a capture member 150 on the tool 160. Claim 57 also includes the further element that the nature of the cooperation between the anchor 170 and tool 160 is non-releasable.

2. Dependent Claim 58

Claim 58, which depends from Claim 57, further defines the capture member 155 as having a lateral recess 180 to receive the anchor 170.

3. Dependent Claim 59

Claim 59, which depends from Claim 58, further defines the anchor 170 as being formed as a generally hook shaped tine 190.

4. Dependent Claim 60

Claim 60, which depends from Claim 57, further defines the hook shaped tine 190 as having an engagement face 195. As defined in the specification, various cooperating surfaces may exist on the engagement face to promote cooperation between the anchor 170 and the tool 160.

H. Concise Explanation of the Invention as Defined in Independent Claim 61 and Dependent Claims 62-65

1. Independent Claim 61

Independent Claim 61 claims the apparatus again with a hollow manipulation shaft 120 that internally receives a prime mover 130. In this embodiment, the prime mover 130 is formed at the distal end with a receiver 250 having an engagement ledge and shelf 290 and a cooperating engager 260 on the tool. Unlike the hook shaped tine 190 and lateral recess 155 embodiments claimed earlier, this embodiment has engaging and receiving areas on both the tool 160 and prime mover 130.

2. Dependent Claim 62

Claim 62, which depends from Claim 61, further defines the receiver 250 as having a generally hook shaped tine recess 270 to mate with the engager 260, and adds the feature of transferring rotational force from the prime mover 130 to the tool 160.

3. Dependent Claim 63

Claim 63, which depends from Claim 61, defines structures reciprocal in function to those claimed in Claim 62, by further defining the engager 260 as having a generally hook shaped tine projection 280 to mate with the receiver 250, and includes the element of transferring rotational force from the prime mover 130 to the tool 160.

4. Dependent Claim 64

Claim 64, which depends from Claim 61, further defines the engager 260 as being formed with a frangible portion 200 that breaks in a direction substantially at right angles to the direction of translation of the prime mover 130.

5. Dependent Claim 65

Claim 65, which depends from Claim 64, further defines the apparatus 100 as being sealed so that any broken frangible portion 200 is retained within the apparatus 100. This closed nature is also critical to the functionality of the device, as will be discussed in detail below, as it acts to minimize or eliminate the chance of small broken

pieces of the frangible portion 200 of the apparatus 100, which is a medical device, from being inadvertently lost inside a patient's body.

I. Concise Explanation of the Invention as Defined in Independent Claim 66 and Dependent Claims 67-70

1. Independent Claim 66

Independent Claim 66 in analogous to Independent Claim 61, but reverses the relative functional positions of the receiver 250 with engagement shelf 290 and ledge and the engager 260; i.e., the receiver 250 with engagement shelf 260 and ledge is now formed on the tool 160'', and the engager 260 is now formed on the prime mover 130''. This embodiment is seen in FIG. 6, and unlike the hook shaped tine 190 and lateral recess 155 embodiments claimed earlier, has engaging and receiving areas on both the tool 160'' and prime mover 130''.

2. Dependent Claim 67

Claim 67, which depends from Claim 66, further defines the receiver 250 as being formed with a generally hook shaped recess 270 sized to non-releasably receive the engager 260. The specification also includes the capability of transferring rotational force from the prime mover 130'' to the tool 160''.

3. Dependent Claim 68

Claim 68, which depends from Claim 66, defines structures reciprocal in function to those claimed in Claim 67, by further defining the engager 260 as having a generally

hook shaped tine projection 280 to non-releasably mate with the receiver 250, and includes the capability of transferring rotational force from the prime mover 130'' to the tool 160''.

4. Dependent Claim 69

Claim 69, which depends from Claim 66, further defines the engager 260 as being formed with a frangible portion 200 that breaks substantially at a right angle to the translational movement of the prime mover 130.

5. Dependent Claim 70

Claim 70, which depends from Claim 69, further defines the apparatus 100 as being sealed so that any broken frangible portion 200 is retained within the apparatus 100. This closed nature is also critical to the functionality of the device, as will be discussed in detail below, as it acts to minimize or eliminate the chance of small broken pieces of the frangible portion 200 of the apparatus 100, which is a medical device, from being inadvertently lost inside a patient's body.

J. Concise Explanation of the Invention as Defined in Independent Claim 71 and Dependent Claims 72-77

1. Independent Claim 71

Independent Claim 71 is a claim directed to a means for performing an intracorporeal surgical procedure, with means plus function claims according to 35

U.S.C. § 112, sixth paragraph, that claims means and functions that are substantially analogous to the functional elements recited in Claim 43 discussed above.

2. Dependent Claim 72

Claim 72, which depends from Claim 71, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions as including at least means for defining a lateral recess adapted to cooperate with and receive mating means and means for transmitting rotational force between the motion imparting means and the interchangeable intervention means, substantially analogous to the functional elements of Claims 43 and 44.

3. Dependent Claim 73

Claim 73, which depends from Claim 72, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions as including a hook shaped tine having an end sized for receipt in the recess and for transmitting rotational force between the motion imparting means and the interchangeable intervention means, substantially analogous to the functional elements recited in Claims 43-45.

4. Dependent Claim 74

Claim 74, which depends from Claim 71, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions from Claim 71 as including a hook shaped tine having an engagement face

adapted to cooperate with the means for capturing and for transmitting rotational force from the motion imparting means.

5. Dependent Claim 75

Claim 75, which depends from Claim 71, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions as including mating means formed with a frangible portion defining means designed to break substantially at a right angle to the translational movement of the motion imparting means, substantially analogous to the functional elements of Claims 43 and 47.

6. Dependent Claim 76

Claim 76, which depends from Claim 75, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions of Claim 75 as including within the frangible portion defining means a means for defining an area of reduced cross section and in which the frangible portion defining means is substantially sealed from the environment.

7. Dependent Claim 77

Claim 77, which depends from Claim 72, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions as including mating means formed with a frangible portion defining means that

is removable after the frangible portion defining means have been severed, substantially analogous to the functional elements of claims 43, 44, and 49.

K. Concise Explanation of the Invention as Defined in Independent Claim 78 and Dependent Claims 79-83

1. Independent Claim 78

Independent Claim 78 is a claim directed to a means for performing an intracorporeal surgical procedure, with means plus function claims according to 35 U.S.C. § 112, sixth paragraph, that claims means and functions substantially analogous to the functional elements of Claim 57, as discussed above.

2. Dependent Claim 79

Claim 79, which depends from Claim 78, is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the means plus functions as including at least means for defining a lateral recess adapted to cooperate with and non-releasably receive anchoring means, substantially analogous to the functional elements of Claims 57 and 58.

3. Dependent Claim 80

Claim 80, which depends from Claim 79 is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines anchoring means as being formed as a generally hook shaped tine having an end sized for non-releasable receipt into the recess, substantially analogous to the functional elements of Claims 57-59.

4. Dependent Claim 81

Claim 81, which depends from Claim 78 is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the anchoring means as being formed with at least one generally hook shaped tine having an engagement face adapted to cooperate with and non-releasably engage the capturing means, substantially analogous to the functional elements of Claims 57-60.

5. Dependent Claim 82

Claim 82, which depends from Claim 78 is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the anchoring means of Claim 78 as being formed with a means for defining a frangible portion designed to break at substantially right angles to the direction of translation of the motion imparting means.

6. Dependent Claim 83

Claim 83, which depends from Claim 82 is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the frangible portion of Claim 82 as defining means as including a means to define a reduced cross section of the anchoring means and wherein the frangible portion defining means is substantially sealed from the environment.

7. Dependent Claim 84

Claim 84, which depends from Claim 79 is a means plus function claim according to 35 U.S.C. §112, sixth paragraph, that further defines the frangible portion defining means of Claim 79 as being adapted to cooperate with and be removably received in the recess after the frangible portion defining means has been severed.

6. THE ISSUES PRESENTED FOR REVIEW

A. Whether Claims 43-84 were properly rejected under 35 U.S.C. §102(b) as being anticipated by Freitas; U.S. Pat. No. 5,486,185 ('185).

B. Whether Claims 43, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81, were properly rejected under 35 U.S.C. 103(a) as being unpatentable over Freitas ('185).

C. Whether Claims 46-48, 63-65, 69-70, 75-76, and 82-84, were properly rejected under 35 U.S.C. §103(a) as being unpatentable over Freitas ('185) in view of Chien (GB 2227412A).

7. GROUPING OF CLAIMS

The rejected claims have been grouped together in each of the rejections. Appellants urge that each of the rejected claims stands on its own recitation, the claims being considered to be separately patentable for reasons set forth in detail below.

8. REFERENCES RELIED UPON BY THE EXAMINER

Freitas, et al.	5,486,185	Jan. 23, 1996
Chien	GB 2227412A	Aug. 1, 1990

9. BRIEF DESCRIPTION OF THE REFERENCES

Freitas et al. ('185) discloses, and illustrates in FIGS. 1-3, a probe 104 having an instrument 20 attached to one end, which is inserted into the patient. The device utilizes a movable probe sleeve 28, which surrounds an immovable probe 52 which is attached to an instrument head 20. The outer probe sleeve 28 moves partially over the instrument head 20 so that camming surfaces 40, 42 are compressed by the leading edge of the moving probe 28, thus pinching the jaws of the instrument head 20. The device is not capable, and does not claim the ability, of imparting significant rotational force to the tool 20, as the button-like instrument flange 106 and T-shaped coupling 122, seen in FIG. 8, connecting probe 52 and tool 20 allows for free rotation of the tool 20 on the probe 52. The probe sleeve 28 is open at the distal (patient) end, as seen in FIG. 1, and all internal parts of the probe end and the coupling area between the probe and the instrument head are in communication with the environment. All parts distal to sealing ring 36 are in fact open to both the environment and the patient, as seen in FIG. 1 and described at Col 4 lines 4-6; wherein the sealing ring is disclosed as being designed to prevent gas from escaping through the lumen of the probe shaft 28. The device does not disclose a frangible portion to facilitate controlled breakage.

Chien is directed to a disposable dental explorer with a frangible handle. The disposable dental explorer has a plastic handle 2 coupled to a stainless steel needle. The handle is provided with a neck portion having a reduced cross-sectional area 3. After use, the handle 2 is broken off at the frangible point 3 to prevent re-use of the explorer. All frangible portions are open to the environment.

10. THE GROUNDS FOR REJECTION

All following references to "Office Action" are to the final Office Action of November 2, 2004. All quotes are as they appear in the Office Action.

A. In the final Office Action (rejecting claims 43-84 under 35 U.S.C. §102(b) as being anticipated by Freitas ('185), the Examiner contends that:

> Claims 43-84 are rejected under 35 U.S.C. 102(b) as being anticipated by Freitas et al. (5,486,185)
>
> Independent claims 43, 50, 51, 61, 66, 71, and dependent claims 44, 53
>
> Freitas discloses a reconfigurable surgical apparatus (figure 4) comprising a surgical instrument assembly, "means for imparting a range of motion" (100) formed with a hollow manipulation shaft"means for defining an intracorporeal passageway" (112) internally receiving a prime mover (104) activated by an actuator (140) located at a proximal end of the shaft; a coupler (see figure 7) including a receiver/engager (106 and 108 combined) formed about a distal end having a capture ledge (106) and shelf (108) that defines a lateral slot (space between 106 and 110 depicted in figure 7); and
>
> an interchangeable surgical tool (20;200, figure 8) attached to the coupler and including a frangible portion (proximal end of 200) and an anchor (212) having a shear notch adapted to non-releasably mate to the capture

ledge/receiver engager and capable of transferring rotational force from the prime mover to the tool (col 2:18-20).

Note: "internally receiving" is construed as a shaft that envelops a tube, such as Freitas' shaft (112) enveloping the tubular probe (104).

Independent Claims 52, 57, 78 and dependent claims 58, 79

Freitas discloses a reconfigurable surgical apparatus (figure 4), comprising: a surgical instrument assembly (100) formed with a hollow manipulation shaft (112) internally receiving a prime mover (104) activated by an actuator (140) located at a proximal end of the shaft;

a coupler (see figure 7) formed about a distal end having a anchor (106) having an engagement face (inherent) that defines a lateral slot (between 106 and 110 depicted in figure 7); and

an interchangeable surgical tool (20;200, figure 8; last sentence of Abstract) attachable to the coupler, and a capture ledge (212, 122) that defines a lateral slot/recess (122) adapted to mate to the anchor (106) and capable of transferring rotational force from the prime mover to the tool (col. 2:18-20).

Dependent Claims

RE: claims 45, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81, Freitas discloses an anchor formed with two generally hook shaped tines/recess/projection (figure 8, formed by projections 212) with engagement faces (214).

RE: claims 46-48, 63-65, 69-70, 75-76, and 82-84, Freitas discloses tines with frangible portions, inherently that is sealed from the exterior environment by the coupler and the manipulation shaft as depicted in figure 4. Frangible is simply defined as 'breakable". Of course the proximal section of element 200 is figure 8 is breakable.

B. In rejecting claims 45, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81, under 35 U.S.C. 103(a) as being unpatentable over Freitas ('185), the Examiner contends:

Claims 43, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81, are rejected under 35 U.S.C. 103(a) as being unpatentable over Freitas ('185).

In addition to the **35 U.S.C. §102** rejections above, the Examiner asserts that even though words such as "tines," "recesses", "slots", "projections", and "hooks" are not **expressly** disclosed in Freitas, it would have been obvious to one of ordinary skill in the art at the time of the invention that the use of a coupler having a lateral slot or hook shaped tine as in the clams represents an unpatentable design choice over the coupler of Freitas that would not change the functionality of the device.

C. In rejecting claims 46-48, 63-65, 69-70, 75-76, and 82-84, under 35 U.S.C. §103(a) as being unpatentable over Freitas ('185) in view of Chien (GB 2227412A), the Examiner contends:

Freitas does not **expressly** disclose a "frangible portion".

Chien discloses a surgical instrument having a notched frangible portion (3).

It would have been obvious to one skilled in the art at the time of the invention to include a frangible portion such as the notched portion in Chien to the device of Freitas to ensure that the interchangeable tool of the device is not used again after it is removed from the coupler.

11. ARGUMENT

All following references to "Office Action" are to the final Office Action of November 2, 2004.

A. Rejection Of Claims 43-84, As Being Anticipated By Freitas; U.S. Pat. No. 5,486,185 ('185); Is Improper Under 35 U.S.C. §102(b).

It is well established that anticipation requires that each and every element of the applicant's claimed invention must be disclosed in a single prior-art reference. In re Paulson, 30 F.3d 1475, 31 U.S.P.Q.2d (BNA) 1671 (Fed. Cir. 1994); In re Spada, 911 F.2d 705, 15 U.S.P.Q.2d (BNA) 1655 (Fed. Cir. 1990). In follows that absence from the reference of any claimed element negates anticipation. Koster Speedsteel AB v. Crucible Inc., 793 F.2d 1565, 230 U.S.P.Q.2d (BNA) 81 (Fed. Cir. 1986). Anticipation will only arise where the description of the invention, as defined by appropriately construed claims, is identically shown in as complete detail as is contained in the applicant's patent claim. Glaverbel S.A. v. Northlake Mkt'g & Supp., Inc. 45 F.3d 1550, 33 U.S.P.Q.2d (BNA)

1496 (Fed. Cir. 1995); Richardson v. Suzuki Motor Co., 868 F.2d 1226, 9 U.S.P.Q.2d (BNA) 1913 (Fed. Cir. 1989).

1. Freitas Does Not, As Erroneously Claimed By The Examiner, Disclose A Hollow Manipulation Shaft Internally Receiving A Prime Mover.

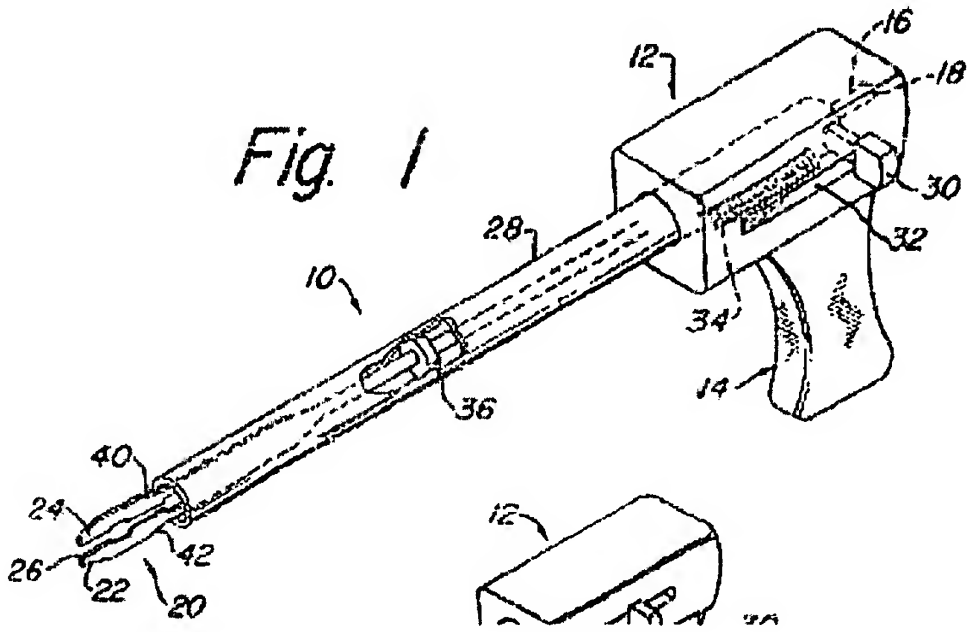
The Examiner asserts that "Freitas discloses a reconfigurable surgical apparatus (figure 4) comprising a surgical instrument assembly... formed with a hollow manipulation shaft... internally receiving a prime mover....[emphasis supplied] This is not correct.

The Freitas device comprises a probe having an instrument attached to one end, which is inserted into the patient. Slidably disposed over the probe is a sliding sleeve, which applies force to the instrument on the probe to affect the desired action. The Freitas device utilizes a probe sleeve 28, which surrounds an immovable probe 52 which is attached to the instrument head 20. Operation of the Freitas device is accomplished by moving the outer probe sleeve 28 over the instrument head 20 so that camming surfaces 40 and 42 are engaged by the inside of the probe sleeve 28 on the jaws 24 and 22. Therefore, the probe 28 is not analogous to the prime mover 130 of the instant invention, as the probe 52 does not "move." In Freitas, it is the probe sleeve 28 that moves.

This is not an unpatentable design choice, as stated by the Examiner, but has serious ramifications for the functionality of the respective devices. Both the Freitas device and the instant invention are designed to work in intracorporeal spaces in close proximity to delicate tissues. Each time the probe sleeve 28 of the Freitas device cams against the instrument head 20, the opportunity arises to tear or crush delicate tissues

between the camming surfaces 40, 42 and the instrument jaws 22 and 24. Additionally, if the Freitas device is inserted into a body through an incision, each time the probe sleeve 28 actuates the instrument, the probe sleeve necessarily moves back and forth, into and out of the skin line of the incision. Such in and out motion is well know in the art to pose an unacceptable risk of introduction of pathogens below the skin line.

In sum, the mode of the operation of the Freitas device and the instant invention are completely different. Freitas slides a moving sheath over a stationary shaft, pinching, in an exposed fashion, the leading edge of the moving sheath against a tool. The instant invention describes a moving shaft inside a stationary outer sheath, wherein the operative coupling between the moving shaft and outer sheath are entirely enclosed. This may be illustrated by comparing the Freitas device and the instant invention:



(Figure 1 of Freitas, showing the moving probe sleeve 28 disposed over the non-moving probe 20)

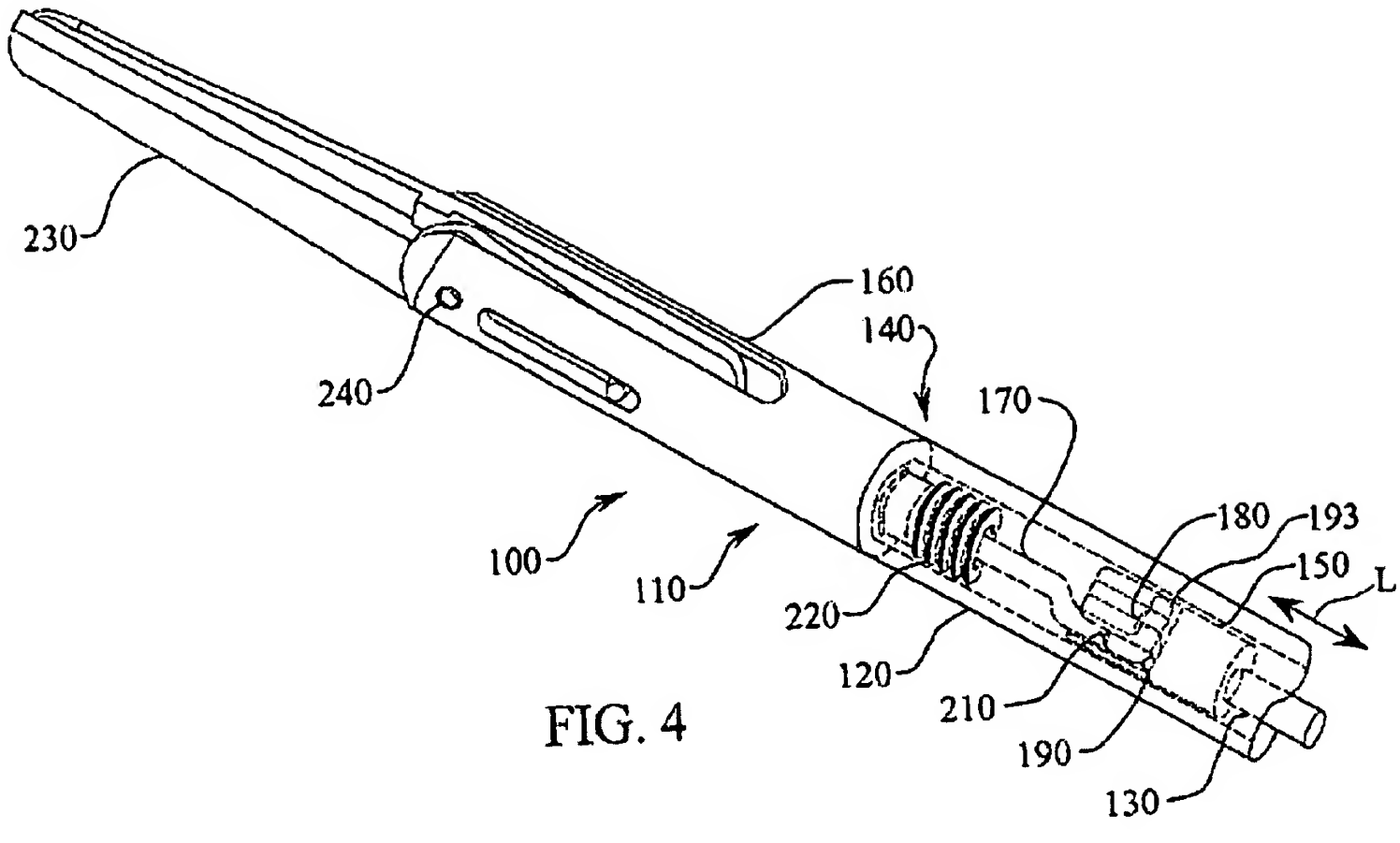


FIG. 4

(Figure 4 of the instant invention, showing the movable prime mover 130 disposed internal to, and moving within, the hollow manipulation shaft 120)

2. In Contrast To The Instant Invention, Freitas Is Incapable Of Imparting Rotational Force From The Prime Mover To The Tool.

Freitas couples (FIGS. 4, 7-8) the probe 104 to the instrument body 200 by means of an instrument flange 106 having a cylindrical body 108 at the distal end of the probe 104. The reciprocating aspect of the instrument body 200, is a "T-shaped (FIGS. 8-9) coupling channel 122, which mates with cylindrical body 108 and instrument flange 106 in rotable engagement."(Col. 5, lines 25-27, emphasis added). Contemplation of the disclosure and inspection of the relevant figures will quickly reveal that the coupling of Freitas is incapable of imparting rotational force from the probe 104 to the instrument body 200. Any rotational force applied to the probe 104 would simply cause the button-like cylindrical body 108 to rotate freely within the coupling channel 122. Freitas

acknowledges this in the detailed disclosure, where he describes how the instrument body would be re-positioned during surgery:

> Also, the embodiment of FIG. 1 can be provided with an instrument head which is rotatable by providing an instrument flange and cylindrical body of such as those illustrated in FIG. 7. This permits the instrument head to be oriented prior to insertion of the instrument in the incision gasket and into the patient. In the event a different orientation is desired, the apparatus may be removed from the patient and the instrument head rotated to the desired orientation and reinserted into the patient.

'185 at Col 7, lines 42-50

In sum, the Freitas device, in order to be rotated during surgery, must be removed from the patient, the tool rotated, and the tool then reintroduced to the patient, a cumbersome process that risks introduction of pathogens into the surgical site with each manipulation of the tool.

In contrast, the instant invention connects a prime mover 130 to a plurality of surgical tools 160 by means of a coupler 140 in which at least one part may be formed as a generally hook shaped tine 190, 280 that mates with a corresponding lateral recess 180, 270. (Seen best in FIGS. 2, 4, and 6) The orientation of the mating components in an orientation that is generally non-axial to the axis of the prime mover 130 allows any rotational force applied to the prime mover 130 to be readily transmitted to the tool 160. Therefore, in operation, a surgeon need only rotate the prime mover 130, without removing it from the patient, or even necessarily making any axial or translational motion of the apparatus 100, in order to easily and effectively rotate the tool 160. Accordingly, it would be possible to rotate the tool while under continuous laparoscopic view, and without the danger of removing and reintroducing the apparatus from the patient. This may be illustrated by comparing the Freitas device and the instant invention:

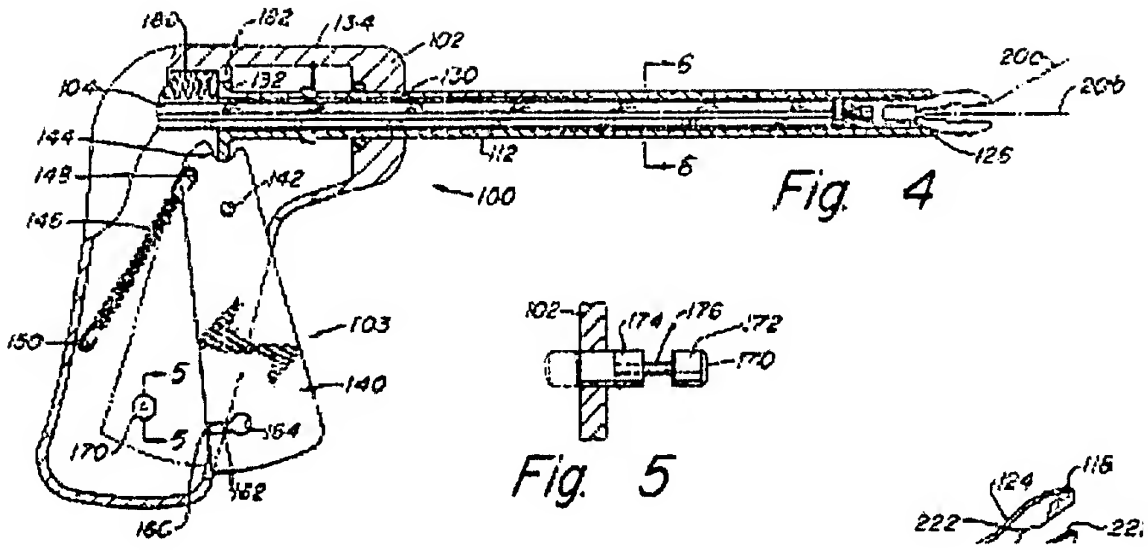


Fig. 4

Fig. 5

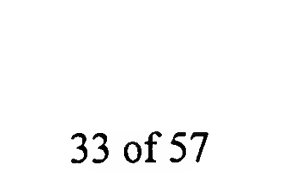


Fig. 7

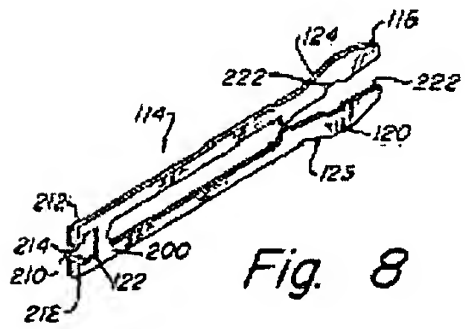


Fig. 8

(FIGS, 4, 7, and 8 of Freitas, showing how the button like cylindrical body 108 fits within the T-shaped coupling channel 212. Any rotational force on the cylindrical body 108 will simply cause the body to spin within the confines of the coupling channel 222, with little or no rotational force being transmitted to the tool 114.)

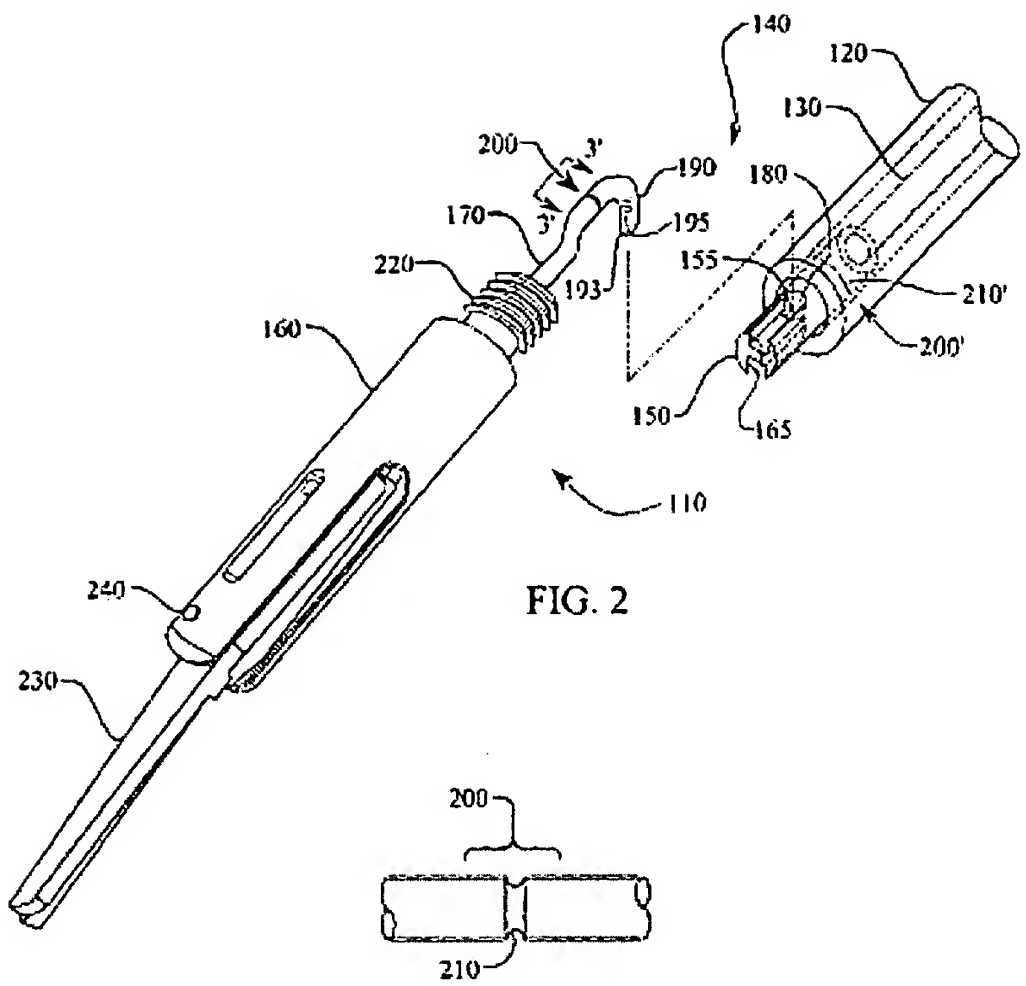


FIG. 2

FIG. 3

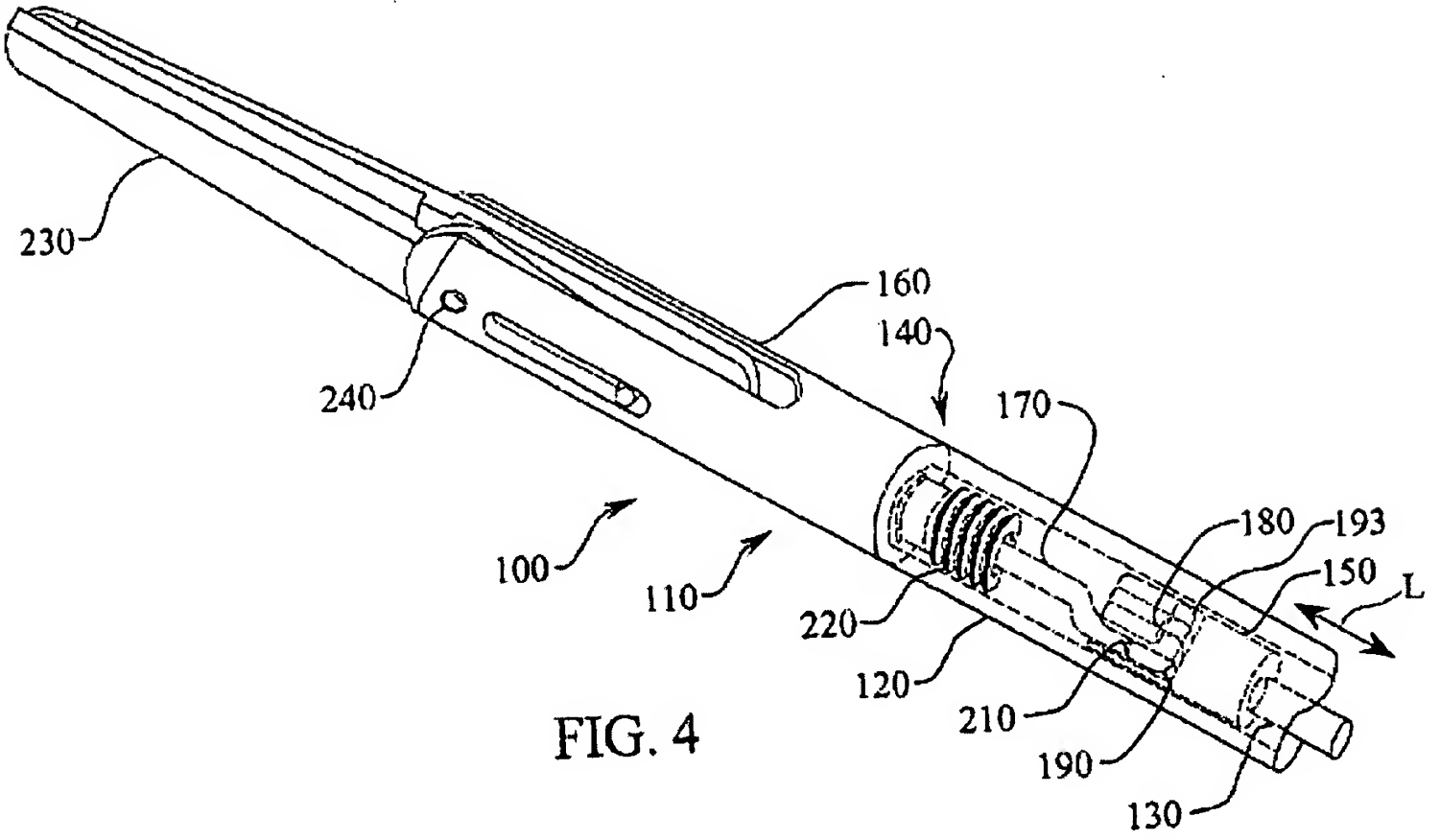


FIG. 4

(FIGS. 2 and 4 of the instant invention. As contrasted with the inability to impart rotational force seen in Freitas, above, it can readily be seen that substantially orthogonal orientation of the hook shaped tine 190 relative to the translational axis of the prime mover 130 necessarily results in any rotational force applied to the prime mover 130 being immediately and fully transferred to the tool 160.)

3. In Contrast To The Instant Invention, Freitas Does Not Teach Any Frangible Sections Designed To Break In A Controlled Manner.

The Office Action states in respect of Freitas that "Frangible is simply defined as 'breakable.' Of course the proximal section of element 200 in figure 8 is breakable." (OA at page 4, second paragraph). While perhaps true in some contexts, in the medical instrument and other design fields, the term frangible is generally accepted as meaning facilitating breakage in a controlled manner in a controlled location, as seen in the Chien reference (GB 2227412A) provided by the Examiner. The frangible section in Chien is seen in FIGS. 1a and 1b, and described on page 4 as, "The neck **3** having a reduced cross sectional area is thereby weakened so as to provide a frangible area which is easy to break."

This same definition of frangible is provided in the instant application:

> For purposes of continued illustration, the frangible portion **200** reflected in the various figures, including FIGS. 2 and 3 is shown to be formed as a circumferential region of reduced diameter, or a generally toroidal, parabolic, or counter-sink shaped shear-type notch **210** that is formed about a portion of the anchor **170**. A similar frangible portion (not shown) can be implemented wherein the frangible portion **200** may be replaced or augmented with a region that is formed by a material of construction of the anchor **170** in the region of the frangible portion **200** to be weaker than the surrounding material of the anchor **170**. This can be accomplished with either a non-circumferential notch, a diametrical or lateral notch formed in the anchor **170**, or functional equivalents thereof. In yet additional examples, the frangible portion **200** may also be formed wherein the material of the anchor **170** material is selected to have a material strength that is reduced in the region of the frangible portion **200** relative to the other portions of the anchor **170**. Another variation may include forming a circumferential score about the anchor **170** in the region of the frangible portion **200**. An additional method includes forming at least one non-circumferential shear notch, which may be similar in cross-section to the notch **210**, within the frangible portion **200** by removing material from the anchor **170** by machining, or by molding the anchor **170** to have the illustrated shear notch **210** or some similar feature.

Instant Application (U. S. Patent Application Publication 2003/0114839 at paragraph 0049)

In contrast, Freitas' device, which contains no hint of frangibility in its specification or claims, possesses frangibility only in the sense that, like any device, it possesses some areas that are mechanically weaker than others, and therefore would be more susceptible to being torn from the device than other areas. However, in the absence of any truly designed frangible area, this would be highly unpredictable. For example, should Freitas' instrument head 160 be made of a high grade surgical tool steel, the proximal section of element 200, seen in FIG. 8, might well be stronger, and hence <u>less</u> frangible, than some other part of the apparatus.

In sum, the only aspect in which Freitas may be found to be frangible is if the term is considered synonymous with "capable of being forcefully torn apart." This may be illustrated by comparing the Freitas device and the instant invention:

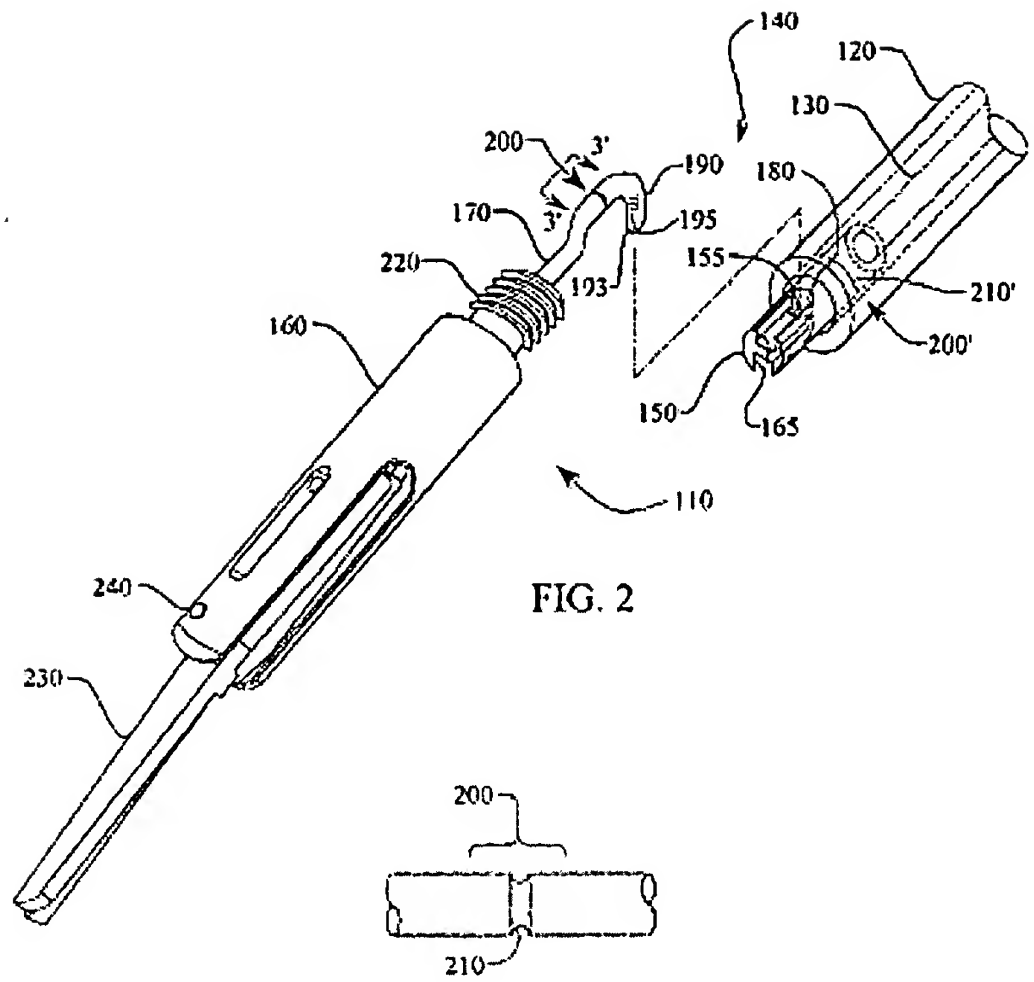


FIG. 2

FIG. 3

(FIGS. 2 and 3 of the instant invention. The frangible portion 200 is clearly illustrated, including one embodiment in which the frangible section is an area of reduced cross section. The frangible portion 200 allows the component to break at a predetermined stress level and in a predetermined position and manner. No analogous structure appears in Freitas.)

4. In Contrast To The Instant Invention, In Which The Frangible Portion Is Entirely Enclosed, Any Frangibility Of The Tool Of Freitas Will Result In Small Objects Being Lost Within The Patient.

If one posits, as with the Office Action, that the "proximal section [of the '185 device] of element **200** in figure 8 is breakable" (OA at page 4, second paragraph), another novel aspect of the instant invention is highlighted.

In Freitas, frangibility, or breakage, of the proximal section of element 200 will have a result that is extremely hazardous to the patient. First, inspection of Freitas'

device, as best seen in FIGS. 1, 2, 8, and 9 shows that it consists essentially of a flat instrument head 20 that is held within a tubular probe sleeve 28. The probe sleeve 28, seen in FIGS. 1, 2, 4, and 10, is open to the environment and is not, as stated in the Office Action at page 4, "sealed from the exterior environment by the coupler and the manipulation shaft as depicted in figure 4." In fact, were the end of the tubular probe sleeve to be closed, or "sealed from the environment," it is highly problematic as to whether the device would work at all, as it depends on translational motion of probe sleeve 28 relative to the instrument head 20 to effect the camming action that in turn effects the opening and closing of the instruments.

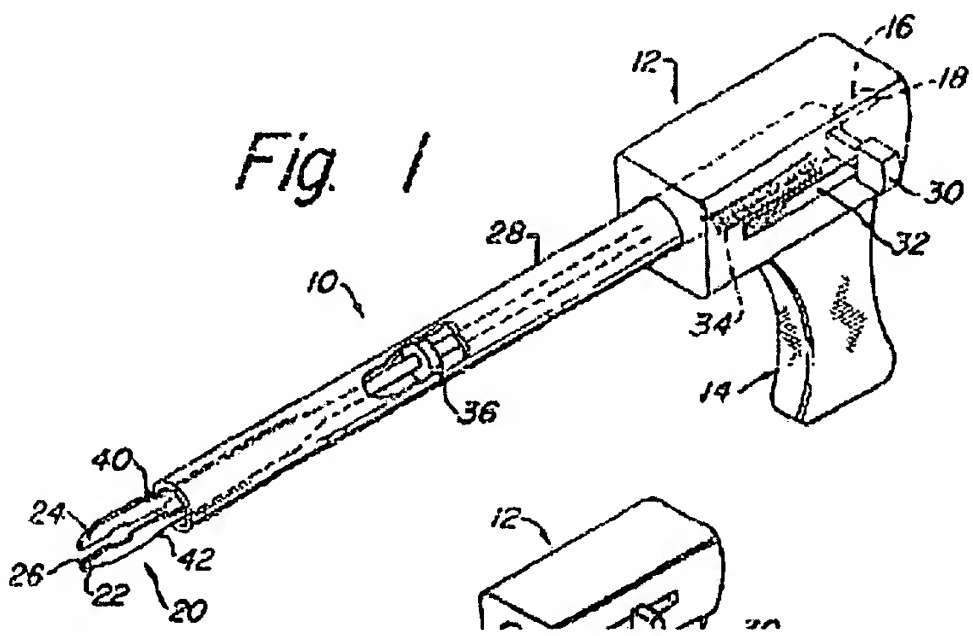
Therefore, should the proximal section of element 200 of FIG. 8 of Freitas be truly frangible, and should it break, the instrument head 20 will likely immediately fall out of the probe sleeve 28 and into the patient, quickly followed by the broken off pieces of the proximal section 200. Even should the instrument head 20 not fall completely out of the probe sleeve 28, inspection of the above mentioned figures shows that there is more than ample room, due to having a flat instrument head 20 surrounded by a tubular sleeve 28, for small broken-off pieces to fall out of the probe sleeve 28 around the instrument head 20. The loss of instrument parts into the patient during laparoscopic surgery is a well-known and highly feared complication of this type of surgery, and when it occurs, contributes greatly to surgical morbidity and mortality.

In contrast, the novelty of the instant invention over Freitas is demonstrated by the complete enclosure of any frangible portions, so that breakage cannot result in any small pieces becoming lost within the patient. Inspection of FIGS. 2, 4, 5, and 6; claims 48, 65, 70, 76, and 83; and the specification, all teach this aspect of the connector 220:

> Next, the capture member **150** is retracted into the hollow manipulation shaft **120,** and the interchangeable surgical tool **160** is secured to the shaft **120** with the connector **220**. The connector **220** may take the form of any of a number of connection devices including, for example without limitation, threads, twist and lock type elements that operate with partial relative rotation much like the so-called child-proof medicine bottle caps and automotive gas tank filler port caps, pin and clevis connectors, clamp and post type frictional connectors, chuck and pin type devices that operate in an manner similar to that of drill bits and chucks, key and keyway and cotter couplers, bayonet type connectors similar to those used in camera lens mounts and in some computer related network cabling components, and scarf joint type couplers. In one of many variations, the connector **220** may take the form of a threaded connection, as shown for purposes of illustration in FIGS. 2, and 4 through 6. In this variation, the male connector threads **220** are receivably engaged with cooperating female threads formed within the coupler **140** at the distal end of the manipulation shaft **120**.
>
> Instant Application (U. S. Patent Application Publication 2003/0114839 at paragraph 0045)

In sum, in those embodiments of the instant invention utilizing a frangible portion, any frangible portion that breaks off during use will be safely retained within the apparatus. The apparatus, with any broken-off pieces safely lodged inside it, may then be easily and safely removed from the patient. This may be illustrated by comparing the Freitas device and the instant invention:

Fig. 1



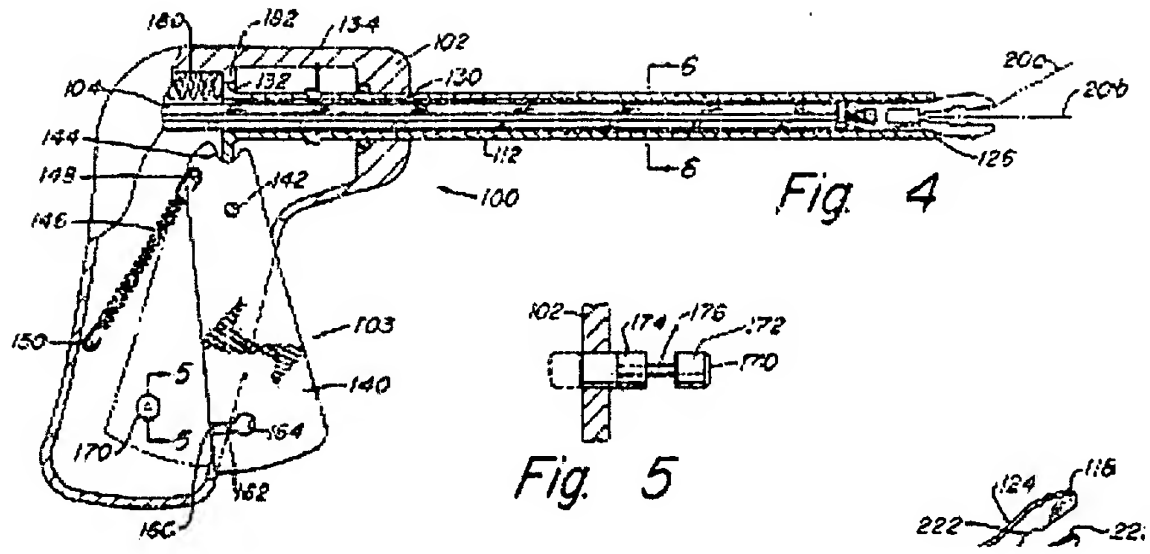


Fig. 4

Fig. 5

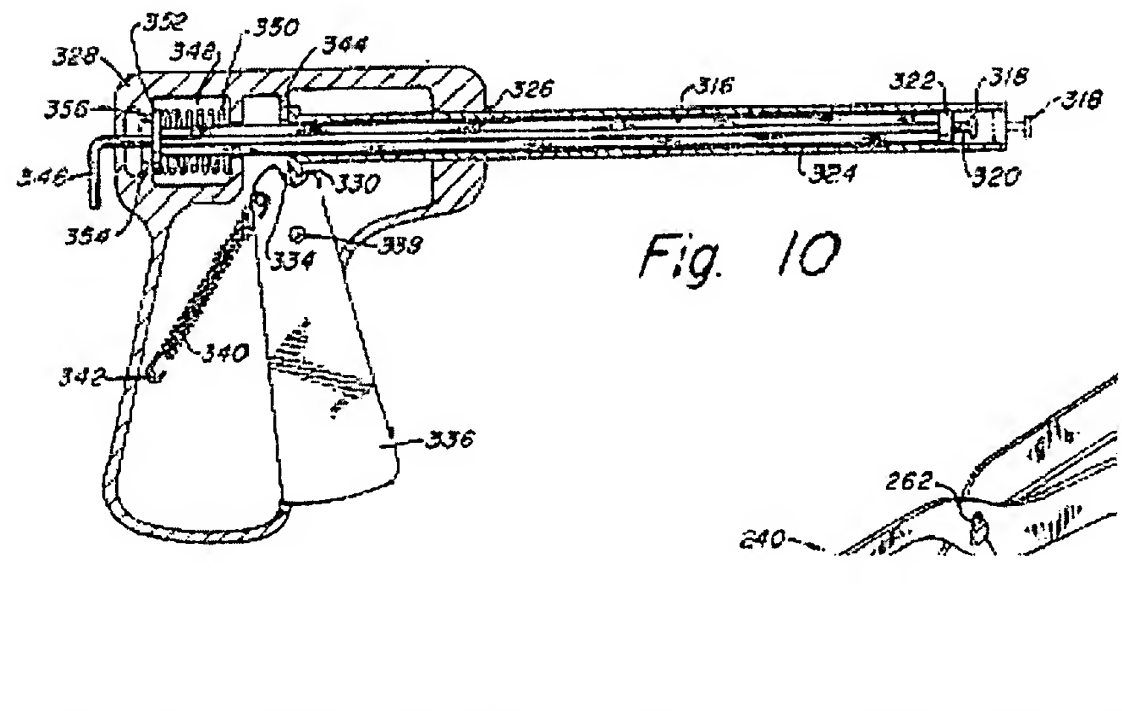


Fig. 10

(FIGS 1, 4, and 10 of Freitas. The distal opening of the movable probe sheath 28 is clearly visible. Any small portions of the instrument that break in this area during use will fall out of the device and into the patient.)

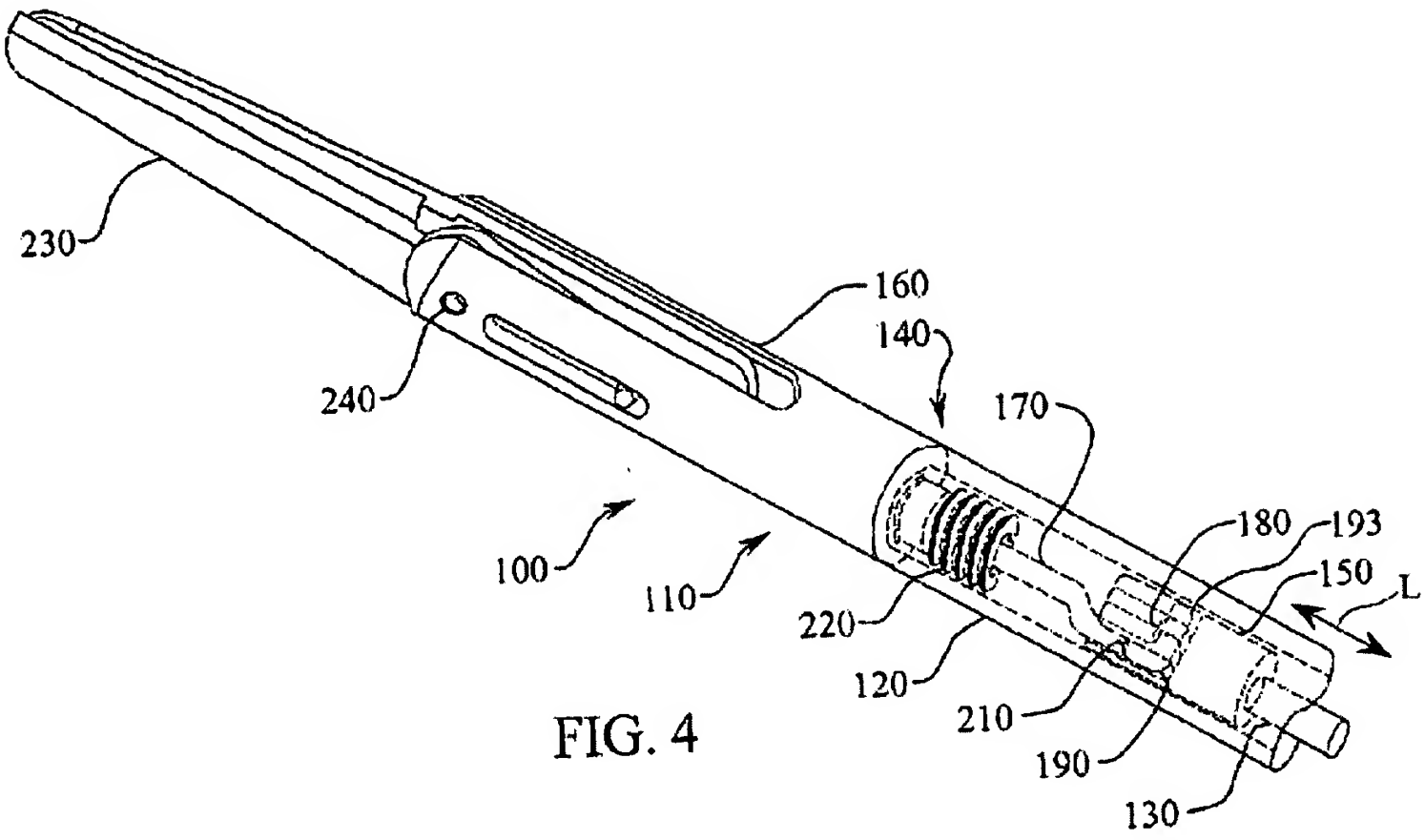

230
240
160
140
170
180
193
150
L
100
110
220
120
210
190
130

FIG. 4

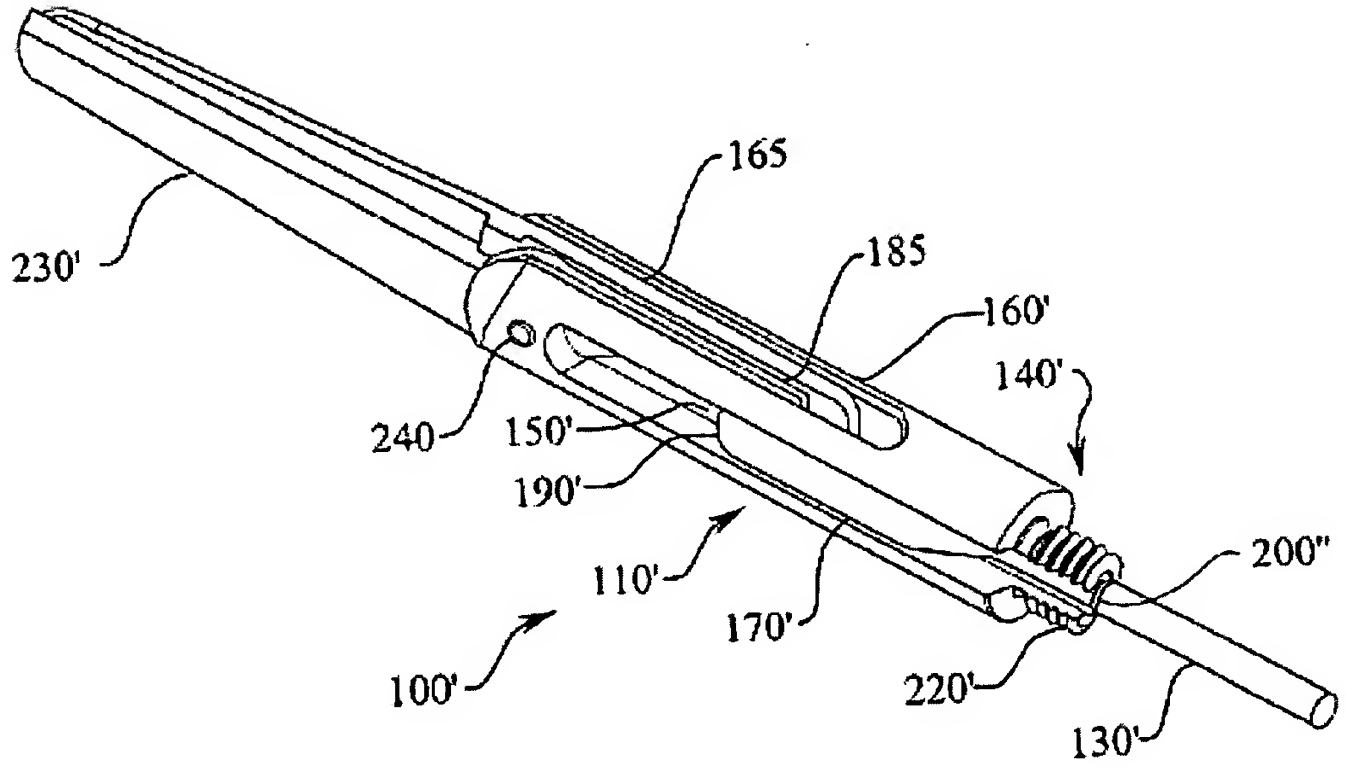

230'
165
185
160'
140'
240
150'
190'
110'
170'
200"
100'
220'
130'

FIG. 5

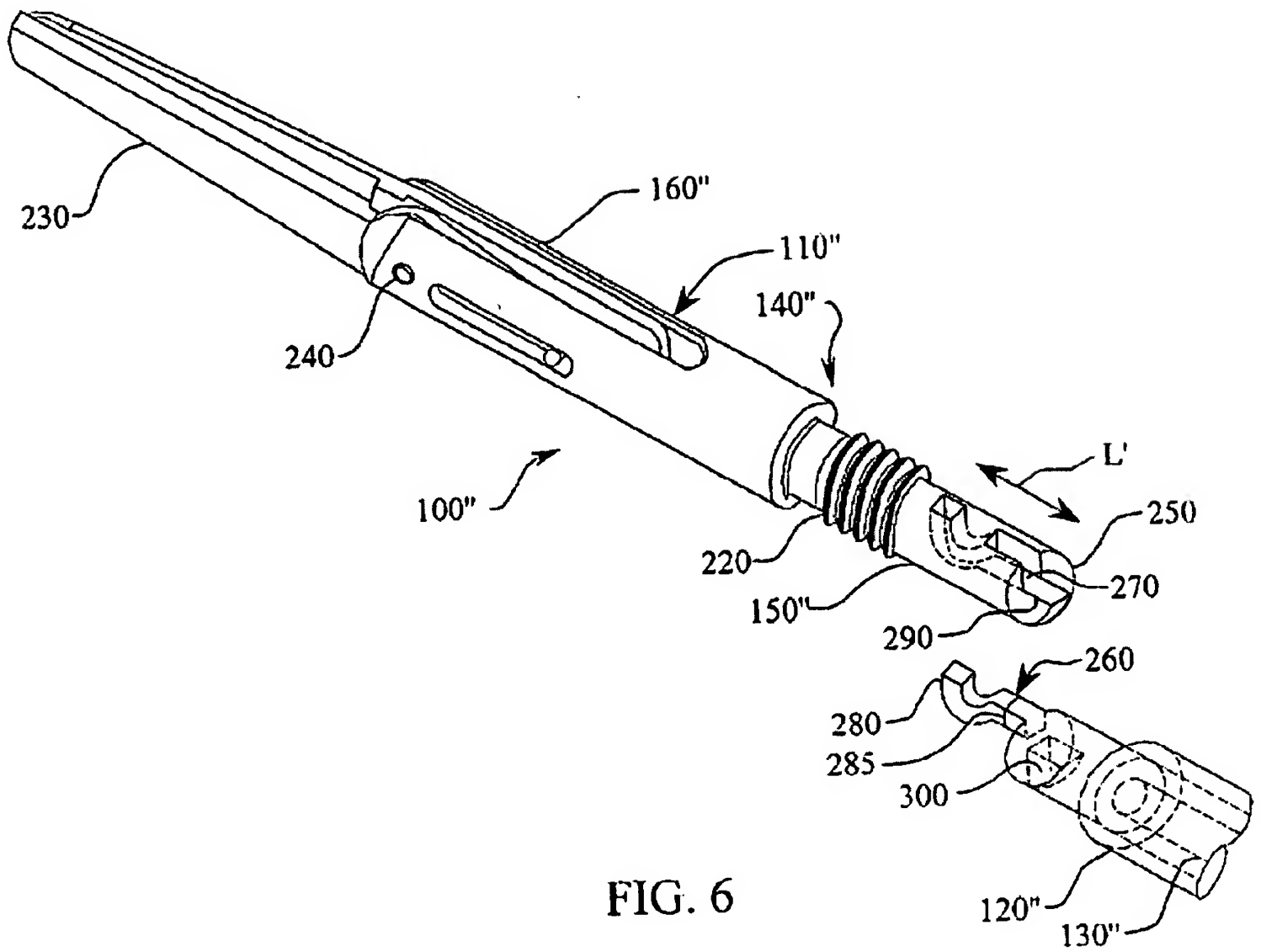


FIG. 6

(FIGS 4, 5, and 6 of the instant invention. Compared to the open environment arrangement found at the distal end of the Freitas device, these illustrations show how the frangible portion 200, 200'' of the instant invention are contained within the device, sealed from the environment and thus necessarily from the patient. In case of breakage of the frangible portion 200, 200'', any small parts will be contained within the device for easy removal.)

B. Rejection Of Claims 45, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81, As Being Unpatentable Over Freitas ('185), Is Improper Under 35 U.S.C. 103(a).

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the

reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488 (Fed. Cir. 1991).

1. There Is No Suggestion Or Motivation, Either In The References Themselves Or In The Knowledge Generally Available To One Of Ordinary Skill In The Art, To Modify The Reference Or To Combine The Reference's Teachings.

Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Lee, 277 F.3d 1338, 1342-44, 61 USPQ2d 1430, 1433-34 (Fed. Cir. 2002) (discussing the importance of relying on objective evidence and making specific factual findings with respect to the motivation to combine references); In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The Applicants argue that the combination of Chien and Freitas is inappropriate, as Chien is totally non-analogous art. The Chien device is a dental device that is totally

removed from the laparoscopic surgical apparatus disclosed in the present invention and in the Freitas reference. The Office Action has inappropriately combined these references and extracted from Chien the notched frangible portion.

The sole purpose of the notched frangible portion of Chien is to allow easy breakage of the instrument to prevent re-use. There is no suggestion that the instrument of Chien would benefit from a controlled break-point so that, during use, the instrument will break in a safe manner if it is overstressed. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).

As discussed, breakage of Chien's dental probe during use would likely represent an extreme hazard to the patient. If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). The open design of Chien would thus be unsatisfactory for an intracorporeal device such as the instant invention.

2. The Suggested Combination Does Not Teach Or Suggest All The Claim Limitations. As Discussed Above, The Instant Invention Incorporates Design Elements That Confer New And Non-Obvious Improvements.

The Office Action rejection of claims 45, 54, 55, 59, 60, 62, 63, 67, 68, 72, 73, 74, 80, and 81 as being unpatentable over Freitas, on the basis that a "lateral slot or hook shaped tine as in the claims represents an unpatentable design choice over the coupler of

Freitas that would not change the functionality of the device," (OA at page 5, number 2) is respectfully traversed.

As discussed above at Section 11(A)(2), the instant invention's utilization of a generally non-axially disposed connecting system imparts the ability to directly transfer rotational force from the prime mover 130 to the tool 160. As such, and as described above, this entirely changes the functionality of the device and imparts new and non-obvious improvements in the functionality of the apparatus.

C. Rejection Of Claims 46-48, 63-65, 69-70, 75-76, And 82-84, As Being Unpatentable Over Freitas ('185) In View Of Chien (GB 2227412A) Is Improper Under 35 U.S.C. §103(a).

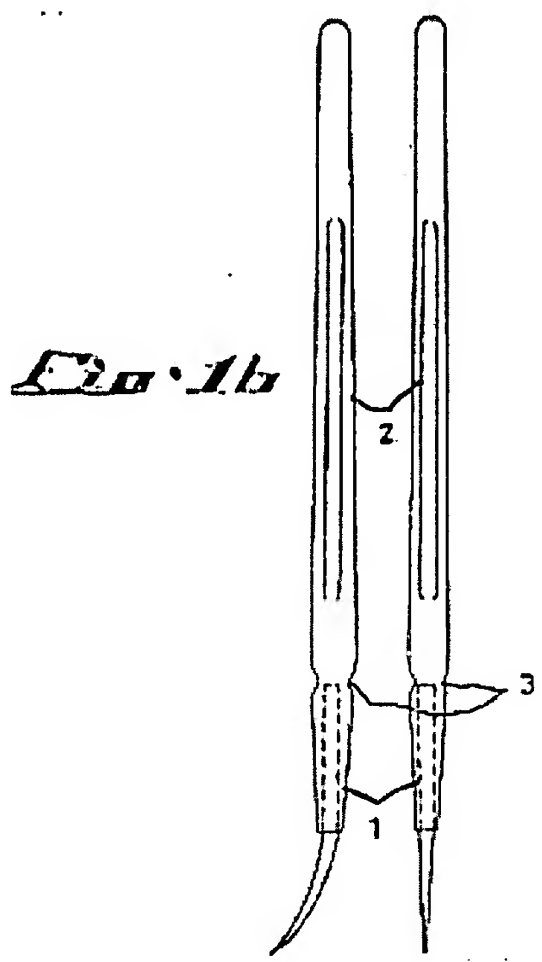
To establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974).

1. The Closed Construction Of The Coupling Of The Instant Invention Is Neither Taught Nor Suggested, Making It Non-Obvious Over Chien.

The Chien reference is directed to a disposable dental explorer with a frangible handle. The disposable dental explorer has a plastic handle coupled to a stainless steel needle. The handle is provided with a neck portion having a reduced cross-sectional area.

More particularly, as discussed above in section 11(A)(4), the enclosed nature of the coupler 140 in the instant invention renders it closed to the loss of any frangible portions that may become severed from the apparatus. This is in marked contrast to the

frangibility envisioned by Chien, where a breakage of the frangible portion during use of the instrument would result in a loss of any broken pieces within a patient, with potentially disastrous results.



(FIG. 1b of Chien. Compared to the instant invention, Chien has a completely exposed frangible portion that does not act as a "fail-safe" to allow breakage in a controlled manner in a sealed environment such that small parts cannot be lost into a patient.)

APPENDIX OF THE APPEALED CLAIMS

WE CLAIM:

43. A reconfigurable surgical apparatus, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft and having a capture ledge; and

an interchangeable surgical tool attachable to the coupler and including an anchor adapted to cooperate with and mate to the capture ledge.

44. The apparatus according to claim 43, wherein the capture ledge is further formed in the coupler to define at least one lateral recess adapted to cooperate with and receive the anchor and capable of transferring rotational force from the prime mover to the tool.

45. The apparatus according to claim 44, wherein the anchor is formed as a generally hook shaped tine having an end sized for receipt into the recess and capable of transferring rotational force from the prime mover to the tool.

46. The apparatus according to claim 43, wherein the anchor is formed with at least one generally hook shaped tine, formed with a frangible portion, that includes an engagement face adapted to cooperate with and non-releasably engage the capture ledge, and the tine to capture ledge engagement is capable of transferring rotational force from the prime mover to the tool.

47. The apparatus according to claim 43, wherein the anchor is formed with a frangible portion designed to break in an orientation substantially orthogonal to a direction of translation of the prime mover.

48. The apparatus according to claim 46, wherein the frangible portion is substantially sealed from an exterior environment by the coupler and the manipulation shaft.

49. The apparatus according to claim 44, wherein the anchor is formed with a frangible portion adapted to cooperate with and be removably received in the recess after the frangible portion of the anchor has been severed.

50. A reconfigurable surgical apparatus, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft having a capture ledge that defines a recess in the coupler; and

an interchangeable surgical tool adapted to cooperate with and connect to the coupler comprising a frangible portion and an anchor adapted to cooperate with and non-releasably mate to the capture ledge and capable of transferring rotational force from the prime mover to the tool, the frangible portion being adapted for receipt in the recess after the anchor has been removed from the tool.

51. A reconfigurable surgical apparatus, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft having a capture ledge that defines a lateral recess in the coupler; and

an interchangeable surgical tool for attachment to the coupler and formed with an anchor having a shear notch, the anchor being adapted to cooperate with and non-releasably mate to the capture ledge and capable of transferring rotational force from the prime mover to the tool, and to be severed from the tool about the notch.

52. A reconfigurable surgical apparatus, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft and incorporating an anchor; and

an interchangeable surgical tool adapted to cooperate with and connect to the coupler and formed with a capture ledge adapted to cooperate with and mate to the anchor and capable of transferring rotational force from the prime mover to the tool.

53. The apparatus according to claim 52, wherein the capture ledge is further formed in the tool to define at least one lateral recess adapted to cooperate with and non-releasably receive the anchor.

54. The apparatus according to claim 53, wherein the anchor is formed as a generally hook shaped tine having an end sized for non-releasable receipt into the recess.

55. The apparatus according to claim 52, wherein the anchor is formed with at least one generally hook shaped tine that includes an engagement face adapted to cooperate with and non-releasably engage the capture ledge.

56. A reconfigurable surgical apparatus, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft to have a generally hook shaped anchor having an engagement face; and

an interchangeable surgical tool formed at an end with a capture ledge that defines a lateral recess in the tool, the ledge being adapted to cooperate with and mate to the engagement face and capable of transferring rotational force from the prime mover to the tool.

57. A reconfigurable surgical apparatus, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft and formed with an anchor; and

an interchangeable surgical tool configured to connect to the coupler and formed with a reciprocating capture member adapted to cooperate with and non-releasably mate to the anchor and capable of transferring rotational force from the prime mover to the tool.

58. The apparatus according to claim 57, wherein the capture member is further formed in the tool to define at least one lateral recess adapted to cooperate with and receive the anchor.

59. The apparatus according to claim 58, wherein the anchor is formed as a generally hook shaped tine having an end sized for receipt into the recess.

60. The apparatus according to claim 57, wherein the anchor is formed with at least one generally hook shaped tine that includes an engagement face adapted to cooperate with and engage the capture ledge.

61. A reconfigurable surgical tool, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft and including a receiver having an engagement ledge and shelf; and

an interchangeable surgical tool attachable to the coupler that includes an engager adapted to cooperate with and mate to the receiver.

62. The apparatus according to claim 61, wherein the receiver further defines a generally hook shaped recess adapted to cooperate with and mate to the engager and capable of transferring rotational force from the prime mover to the tool.

63. The apparatus according to claim 61, wherein the engager is further formed with a generally hook shaped projection adapted to cooperate with and mate to the receiver and capable of transferring rotational force from the prime mover to the tool.

64. The apparatus according to claim 61, wherein the engager is formed with a frangible portion designed to break in an orientation substantially orthogonal to the direction of translation of the prime mover.

65. The apparatus according to claim 64, wherein the frangible portion is sealed from an exterior environment by the coupler and the manipulation shaft.

66. A reconfigurable surgical tool, comprising:

a surgical instrument assembly formed with a hollow manipulation shaft internally receiving a prime mover activated by an actuator located at a proximal end of the shaft;

a coupler formed about a distal end of the shaft and formed with an engager; and

an interchangeable surgical tool formed with a receiver formed with an engagement ledge and shelf and adapted to cooperate with mate to the engager.

67. The apparatus according to claim 66, wherein the receiver is further formed to define a generally hook shaped recess sized to non-releasably receive the engager and capable of transferring rotational force from the prime mover to the tool.

68. The apparatus according to claim 66, wherein the engager further incorporates a generally hook shaped projection adapted for non-releasable receipt in the recess to releasably mate to the receiver and capable of transferring rotational force from the prime mover to the tool.

69. The apparatus according to claim 66, wherein the engager is formed with a frangible portion designed to break in an orientation substantially orthogonal to the direction of translation of the prime mover.

70. The apparatus according to claim 69, wherein the frangible portion is sealed from an exterior environment by the coupler and the manipulation shaft.

71. A means for performing an intracorporeal surgical procedure, comprising:

a means for imparting a range of motion;

a means for defining an intracorporeal passageway connected at a proximal end to the motion imparting means, the passageway being internally received with a means for transmitting the imparted range of motion;

a means for distally coupling the passageway means that defines a means for interchangeably capturing;

an interchangeable means for performing a surgical intervention that includes a means for mating the intervention means to the capturing means; and

wherein the interchangeable intervention means is, when mated to the capturing means, remotely actuatable by operation of the motion imparting means.

72. The means for performing an intracorporeal surgical procedure according to claim 71, wherein the capturing means is further formed in the coupling means to define at least means for defining a lateral recess adapted to cooperate with and receive the mating means and capable of transmitting rotational force between the motion imparting means and the interchangeable intervention means.

73. The means for performing an intracorporeal surgical procedure according to claim 72, wherein the mating means is formed as a generally hook shaped tine having an end sized for receipt into the recess and capable of transmitting rotational force between the motion imparting means and the interchangeable intervention means.

74. The means for performing an intracorporeal surgical procedure according to claim 71, wherein the mating means is formed with at least one generally hook shaped tine that includes an engagement face adapted to cooperate with and engage the means for capturing and the mating means is capable of transmitting rotational force between the motion imparting means and the interchangeable intervention means.

75. The means for performing an intracorporeal surgical procedure according to claim 71, wherein the means for mating is further formed with a means for defining a frangible portion of the mating means designed to break in an orientation substantially orthogonal to a direction of translation of the motion imparting means.

76. The means for performing an intracorporeal surgical procedure according to claim 75, wherein the frangible portion defining means is further formed with a means to define a reduced cross section of the mating means and the frangible portion defining means is substantially sealed from an exterior environment by the passageway means and the coupling means.

77. The means for performing an intracorporeal surgical procedure according to claim 72, wherein the mating means is formed with a frangible portion defining means adapted to cooperate with and be removably received in the recess after the frangible portion defining means has been severed.

78. A means for performing an intracorporeal surgical procedure, comprising:

a means for imparting a range of motion;

a means for defining an intracorporeal passageway connected at a proximal end to the motion imparting means, the passageway being internally received with a means for transmitting the imparted range of motion;

a means for distally coupling the passageway means that defines a means for anchoring;

an interchangeable means for performing a surgical intervention that includes a means for capturing the anchoring means; and

wherein the interchangeable intervention means is, when mated to the anchoring means, remotely actuatable by operation of the motion imparting means and capable of transmitting rotational force between the motion imparting means and the interchangeable intervention means.

79. The means for performing an intracorporeal surgical procedure according to claim 78, wherein the capturing means is further formed in the intervention means to define at least one means for defining a lateral recess adapted to cooperate with and non-releasably receive the anchoring means.

80. The means for performing an intracorporeal surgical procedure according to claim 79, wherein the anchoring means is formed as a generally hook shaped tine having an end sized for non-releasable receipt into the recess.

81. The means for performing an intracorporeal surgical procedure according to claim 78, wherein the anchoring means is formed with at least one generally hook shaped tine that includes an engagement face adapted to cooperate with and non-releasably engage the means for capturing.

82. The means for performing an intracorporeal surgical procedure according to claim 78, wherein the means for anchoring is further formed with a means for defining a frangible portion of the anchoring means designed to break in an orientation substantially orthogonal to a direction of translation of the motion imparting means.

83. The means for performing an intracorporeal surgical procedure according to claim 82, wherein the frangible portion defining means is further formed with a means to define a reduced cross section of the anchoring means and the frangible portion defining means is substantially sealed from an exterior environment by the passageway means and the coupling means.

84. The means for performing an intracorporeal surgical procedure according to claim 79, wherein the anchoring means is formed with a frangible portion defining means adapted to cooperate with and be removably received in the recess after the frangible portion defining means has been severed.